Elliot Epstein

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EDUCATION

Stanford University — **Stanford, California**
Ph.D. in Computational and Mathematical Engineering — Jul. 2022 – Jun. 2025
Master of Science in Computational and Mathematical Engineering (GPA: 4.18/4.30) — Sep. 2021 – Jun. 2024

- Coursework: Numerical Linear Algebra, Reinforcement Learning, Natural Language Processing, Optimization, Discrete Mathematics and Algorithms, Numerical and Theoretical PDEs, Stochastic Methods, Computer Systems
- Anticipated Coursework: Deep Generative Models, Decision Making under Uncertainty, Data Mining, Parallel Computing, Bayesian Statistics

University of Oxford — **Oxford, United Kingdom**
Master of Science in Mathematical and Computational Finance — Sep. 2020 – Jul. 2021

- Relevant Coursework: Stochastic Calculus, Financial Derivatives, Statistics and Financial Data Analysis, Numerical Methods, Financial Computing with C++, Fixed Income and Credit, Stochastic Control, Quantitative Risk Management, Deep Learning, Advanced Monte Carlo Methods, Algorithmic Trading, Optimization

KTH Royal Institute of Technology — **Stockholm, Sweden**
Bachelor of Science in Engineering Physics (GPA: 4.94/5.00) — Aug. 2017 – Aug. 2020

ETH Zurich — **Zurich, Switzerland**
Exchange Student, Department of Mathematics — Sep. 2019 – Aug. 2020

- Thesis: "A Review of the Article *Gradient Descent Provably Optimizes Over-parametrized Neural Networks*"

Zhejiang University — **Hangzhou, China**
Summer Project in Machine Learning — Jun. 2019 – Jul. 2019

- Project title: "Semantic Image Segmentation Based on Deep Learning"

Stockholm University — **Stockholm, Sweden**
Bachelor of Science in Economics, Business Administration (*selected courses*) — Aug. 2018 – Jan. 2019

WORK EXPERIENCE

Stanford University — **Stanford, California**
Research Assistant — Sep. 2022 – Apr. 2023

- Long sequence modeling with Prof. Christopher Re in the Stanford AI Lab

Research Assistant — Apr. 2022 – Sep. 2022

- Machine learning to solve PDEs in Prof. Eric Darve's lab

Course Assistant: Machine Learning (CS 229), Partial Differential Equations (MATH 220) — Jun. 2022 – Dec. 2022

- Topics covered: Supervised learning (deep learning), unsupervised learning, reinforcement learning, PDEs

EDF Trading — **London, United Kingdom**
Intern, Quant and Data Group — Apr. 2021 – Aug. 2021

- Developed a model in Python to predict the direction of the next trade of day ahead gas futures with over 70 percent accuracy using LOB data and an ensemble of LSTM networks trained on multiple GPUs in the cloud
- Built a web application to display real time predictions from neural network and random forest models to predict the 15-minute ahead closing price of month ahead gas futures
- Created an environment for trading using limit order book (LOB) data, and utilized a proximal policy optimization reinforcement learning agent to create a trading strategy for month ahead gas futures

Karolinska Institute — **Stockholm, Sweden**
Research Assistant — Aug. 2019 – Apr. 2021

- Developed a deep learning model to differentiate benign from malignant ovarian tumors. The model achieved a sensitivity of 95% and a specificity of 92% in cases where 12% of the images were regarded as difficult to classify (an expert ultrasound examiner had a sensitivity of 92% and a specificity of 83% with regard to the same patients)
- Study Coordinator and member of the Steering Committee for a large validation study (20 ultrasound centers worldwide) to evaluate the generalizability of the deep learning model

PUBLICATIONS

Daniel Y. Fu∗ , **Elliot L. Epstein**∗, Eric Nguyen, Armin W. Thomas, Michael Zhang, Tri Dao, Atri Rudra, and Christopher Re. Simple Hardware-Efficient Long Convolutions for Sequence Modeling
In Mathematical and Empirical Understanding of Foundation Models workshop at ICLR 2023

F Christiansen, **E L Epstein**, E Smedberg, M Åkerlund, K Smith, E Epstein. Ultrasound image analysis using deep neural networks for discriminating between benign and malignant ovarian tumors: comparison with expert subjective assessment. In *Ultrasound Obstet Gynecol* 2021; 57: 155-163. DOI: 10.1002/uog.23530.

SKILLS

Technical (in order of proficiency)**:** Python (NumPy, PyTorch, TensorFlow, Keras, Flask, Gym, pandas, Horovod), C++, C, MATLAB, Latex, Linux, GitHub, Azure Machine Learning, Docker, R
Languages: Swedish (fluent), English (fluent), German (intermediate), Spanish (basic)